EJVES Extra (2009) **18**, 15–17

SHORT REPORT

An Unusual Cause of Recurrent Pulmonary Emboli

J. Young*, R. Mofidi, A. Howd, G. Griffiths

East of Scotland Vascular Network, Vascular Surgery, Ninewells Hospital, Dundee DD1 9SY, UK

Submitted 12 August 2008; accepted 30 March 2009

KEYWORDS
Popliteal venous aneurysm;
Recurrent pulmonary emboli: popliteal vein;
Surgery;
Hyperflexibility

Abstract The authors report a 51-year-old female primary care physician who attended the emergency medical department with pleuritic chest pain, shortness of breath and associated tachycardia. She had 6 weeks previously been admitted and treated for similar features with the diagnosis of pulmonary emboli made from a positive ventilation–perfusion scan. CT scanning confirmed the diagnosis of multiple bilateral pulmonary emboli but no abdominal or pelvic pathology and without evidence of deep venous thrombosis. Further clinical assessment found generalised hyperflexibility and swelling of the left popliteal region. Duplex ultrasonography followed by venography confirmed a 5-cm unilateral saccular aneurysm of the above knee popliteal vein containing central thrombus. A temporary IVC filter (Cook, Tulip) was placed and primary aneurysmectomy was performed through a posterior approach.

Popliteal venous aneurysms are rare but can present at any age and are associated with wall weakness from many causes. Pulmonary embolism is the most frequent presentation and is not dependant on visualized clot on imaging. As anticoagulation may be ineffective in preventing pulmonary embolism it is recommended all patients should undergo surgical repair.

Introduction

Popliteal venous aneurysms are rare but potentially life threatening because they can be a source of recurrent pulmonary emboli despite therapeutic warfarinisation.

Case report

A 51-year-old female primary care physician attended the emergency medical department with pleuritic chest pain, shortness of breath and associated tachycardia. She had 6 weeks previously been admitted and treated for similar features with the diagnosis of pulmonary emboli made from a positive ventilation–perfusion scan but without a venous assessment and was warfarinised within the therapeutic range.

CT scanning on the second admission confirmed the diagnosis of multiple bilateral pulmonary emboli but no abdominal or pelvic pathology and without evidence of deep venous thrombosis. Further clinical assessment found generalised hyperflexibility (Fig. 1) and a slight swelling of the left popliteal region. Duplex ultrasonography followed by venography confirmed a 5-cm unilateral saccular aneurysm of the above knee popliteal vein containing central

DOI of original article: 10.1016/j.ejvs.2009.03.030.
* Corresponding author. Tel.: +44 1382 633990.
E-mail address: jamie.young@nhs.net (J. Young).

1533-3167
doi:10.1016/j.ejvsextra.2009.03.005

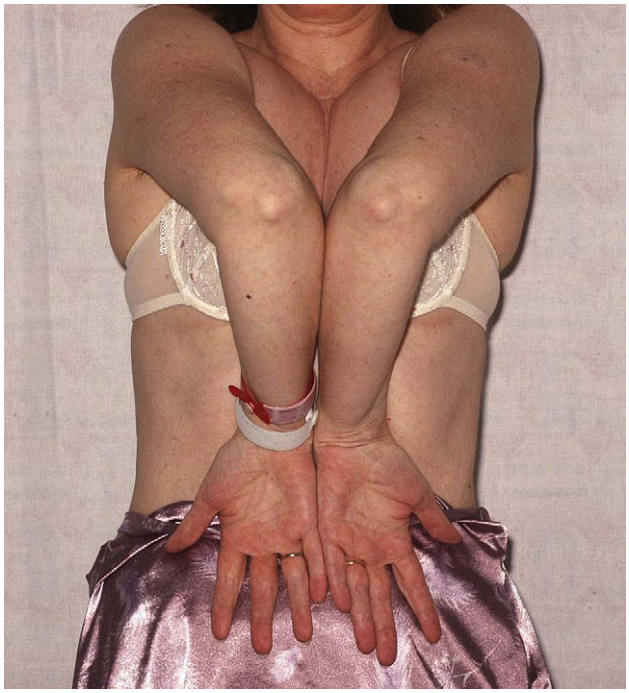

Figure 1 Generalised hyperflexibility.

thrombus (Fig. 2). After placement of a temporary IVC filter (Cook, Tulip) and reversal of anticoagulation, surgery was performed. Primary aneurysmectomy was performed through a posterior approach (Fig. 3). Opening the excised aneurysm confirmed the presence of a large amount of clot.

Recovery was uncomplicated; however the IVC filter was unable to be removed. The patient was recommenced on lifelong anticoagulation with no further embolic episodes and follow-up duplex scanning has shown normal flow with the vein at 1 year.

Discussion

Popliteal venous aneurysms are rare. The first was described in 1968[1] and the first symptomatic case with a pulmonary embolism in 1976.[2] The overall population incidence is unknown. Studies investigated a total of 7380 people and found 10 popliteal vein aneurysms (0.14%).[3] The literature describes only 120 symptomatic cases.[4] Popliteal venous aneurysms are true aneurysms of all layers. The exact aetiology is unknown but is associated with trauma, inflammation, congenital weakness and localized degenerative changes.[3–6] This patient has widespread hyperflexibility consistent with an unspecified connective tissue abnormality. Pathology is a form of degeneration with disruption and loss of elastic fibres together with loss of medial smooth muscle cells and fibrosis.

The median age of presentation is 51 in females and 49 in males but with a range of 12—86 years. There is a female predominance (56%) and is commoner on the left (56%) with 3% bilateral.[3] Embolic phenomenon was the commonest presentation affecting 44%, local symptoms (mass) 36%, venous complications (thrombosis/insufficiency) 19% and arterial symptoms at 4%.[3]

Diagnosis is usually made using a combination of duplex ultrasonography with phlebography, CT and MRI alternatives.[3–6] Saccular aneurysms are more common (76%) than

Figure 2 Venogram of left popliteal venous aneurysm with central clot.

fusiform aneurysms (24%).[4] The presence of clot in the aneurysm sac is associated with a higher incidence of embolic events (50%[5] to 63%[4]) however absence of clot is still associated with pulmonary embolism (7%[5] to 23%[4]) of cases. Of 23 patients treated with primary anticoagulant 43% developed subsequent embolic complications.[4] Surgical repair is most commonly performed through a posterior approach to allow proximal control to prevent embolisation.[4] Saccular aneurysms usually have a broad attachment to the popliteal vein allowing primary aneurysmectomy and lateral venorrhaphy where as fusiform aneurysms can be treated with resection and reanastomosis, interposition graft, bypass or ligation.[3–6]

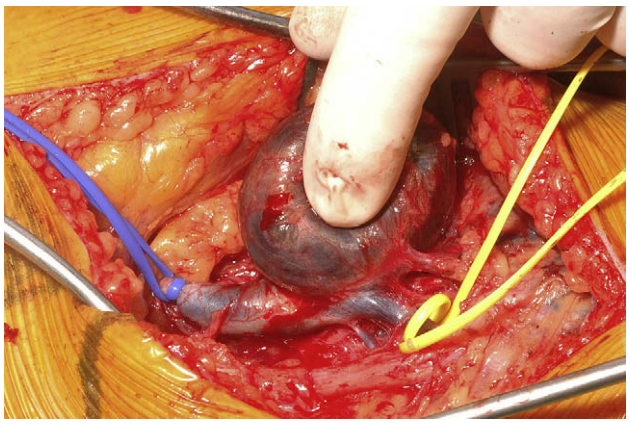

Figure 3 Operative photograph demonstrating broad based popliteal aneurysm through a posterior approach.

Postoperatively patients require anticoagulation for at least three months due to the risk of thrombosis.[4–6]

Conclusion

Popliteal venous aneurysms are rare but can present at any age and are associated with wall weakness from many causes. Pulmonary embolism is the most frequent presentation and is not dependant on visualized clot on imaging. As anticoagulation may be ineffective in preventing pulmonary embolism it is recommended all patients should undergo surgical repair.

Conflict of Interest

None.

Funding

None.

References

1 May R, Nissl R. Aneurysms of the popliteal vein. *Fortschritte auf dem Gebiete der Rontgenstrahlen und der Nuklearmedizin* 1968 Mar;**108**(3):402—3.
2 Dahl JR, Freed TA, Burke MF. Popliteal vein aneurysm with recurrent pulmonary thromboemboli. *JAMA* 1976 Nov 29; **236**(22):2531—2.
3 Bergqvist D, Bjorck M, Ljungman C. Popliteal venous aneurysm — a systematic review. *World Journal of Surgery* 2006 Mar;**30**(3): 273—9.
4 Nasr W, Babbitt R, Eslami MH. Popliteal vein aneurysm: a case report and review of literature. *Vascular and Endovascular Surgery* 2007 Dec—2008 Jan;**41**(6):551—5.
5 Sessa C, Nicolini P, Perrin M, Farah I, Magne JL, Guidicelli H. Management of symptomatic and asymptomatic popliteal venous aneurysms: a retrospective analysis of 25 patients and review of the literature. *Journal of Vascular Surgery* 2000 Nov;**32**(5): 902—12.
6 Christenson JT. Popliteal venous aneurysm: a report on three cases presenting with chronic venous insufficiency without embolic events. *Phlebology* 2007;**22**(2):56—9.